Hippos as ecosystem engineers? Grazing lawns and their determinants in the St Lucia floodplain

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Hippos are selective nocturnal grazers that are capable of modifying the landscape by creating grazing lawns. Lawns occur as a consequence of intensified, consistent cropping of tall bunch grass species, the effect of which is to modify vegetation dynamics within the landscape, such that the plant diversity of the landscape is enhanced, forage quality is improved, soil nutrient availability is augmented, and fire regimes may be altered. However, there is much ambiguity as to whether factors such as water table depth contribute toward lawn formation in the iSimangaliso Wetland Park system, or, whether lawns can be created based solely on feedbacks between past grazing events and future ones. Sampling took place in July 2012, during the dry season. Data were collected along 30 linear transects; 20 located in grazed vegetation (lawn sites) and 10 in adjacent non-grazed vegetation (non-lawn sites), and species composition, vegetation height, depth to the water table, soil C% and the fire margin were measured. Here we show that hippos were the primary biological agents contributing toward lawn formation, as water table depth was not a significant predictor of vegetation height. However, changes in vegetation across the landscape may be accentuated by soil type, grazing intensity and topography. The implication for park management is that culling the local hippo population is likely to have substantial ramifications on forage availability for smaller herbivores, plant community composition, as well as fire dynamics. However, the abiotic components of the system cannot be overlooked, and monitoring the effect of rainfall on flooding and on forage biomass will become increasingly important in a changing climate.

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New ecological understanding from old restoration sites - unifying concepts, relationships and thresholds among ecosystem processes

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In 1999 Steven G. Whisenant published a conceptual model which has become arguably one of the most important unifying concepts in restoration ecology in the last 20 years. The model simply conceptualizes, firstly a physical threshold, and secondly a biological threshold, which must be breached by restoration interventions in order for an ecosystem to transition from a fully degraded state to a fully restored state. Here we present a third dimension to this model, a revision of the original dimension of environmental condition, but a counterpart to the original dimension of time. We show that the single dimension of environmental condition conflates a recovery in species composition with a recovery in ecological function. Our global meta-analysis indicates that there is a relationship between many aspects of ecosystem function and species composition, but that ecosystem function can recover to near pre-degradation levels with only a partial recovery in species composition. The revised model is widely generalizable (e.g. to biomes across the globe), and the thresholds in the model neatly distinguishes among the processes of disturbance, succession, degradation and restoration, thereby providing a unifying framework for understanding these ecosystem processes. The model is particularly relevant for the 21st century where natural succession from primary disturbances (from glaciation, landslides, volcanoes etc.) is a rare event, but human induced degradation of ecosystems is ubiquitous.

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Neighbourhood effects on reproductive success in the endangered montane *Aloe peglerae*

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It is well recognised that highly fragmented and/or declining plant populations may be less attractive to pollinators. As a consequence, this can lead to a decline in any component of individual or overall fitness within a population. The Allee effect is particularly common in rare or endangered plant species. The aim of this study was to investigate the neighbourhood effects of local plant density on the reproductive success of conspecifics in a relatively large population (c. 500–1000 plants) of the nectar-rewarding, generalist bird-pollinated *Aloe peglerae*. We mapped the location, using a handheld differential GPS, of ~500 aloe individuals and measured the distance between 35 focal aloes and their conspecific nearest neighbours. Individual fruit set, seed set and total seed production was measured for each focal aloe to determine the effects of local plant density on reproductive output. Pollinator visitation rates and feeding patterns were recorded using camera trap observations at focal aloes throughout the duration of flowering. We report on the effects of variation in plant densities on individual plant reproductive success, and identify if there is a density threshold at which reproductive success declines. We also report on patterns in pollinator visitation frequency and foraging. We discuss the implications of the likelihood of pollinator limitation in this population of *Aloe peglerae*, and the consequences this may have on other much smaller declining populations of this endangered succulent.

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Extinction risk in eastern African flora

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We analyse the phylogenetic pattern and model the spatial distribution of extinction risk in Eastern Arc Mountain, an important but woefully understudied biodiversity hotspot from phylogenetic perspective. We particularly highlight how "Not Evaluated Species" are traditionally treated in comparative studies of extinction risk, and then discuss the potential bias attached to such treatment.

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